CONTENTS

Volume 34, Issue Nos. 1–3 (1992)

International Journal for

NUMERICAL METHODS IN ENGINEERING

Issue No. 1

Special Issue on the **World Congress of Computational Mechanics Part I**

PREFACE 1

NOTE FROM LOCAL ORGANISING COMMITTEE 3

PLENARY LECTURE

Computational Mechanics Today: O. C. Zienkiewicz 9

MODELLING OF PLATES AND SHELLS

Shell Theory Versus Degeneration – a Comparison in Large Rotation Finite Element Analysis: N. Buechter and E. Ramm 39

Non-linear Analysis of Sandwich Shells: O. Aamlid and P. G. Bergan 61

An Exact Finite Rotation Shell Theory, its Mixed Variational Formulation and its Finite Element Implementation: C. Sansour and H. Bufler 73

On a Stress Resultant Geometrically Exact Shell Model. Part VI: Conserving Algorithms for Non-linear Dynamics: J. C. Simo, M. S. Rifai and D. D. Fox 117

Finite-rotation Shell Elements for the Analysis of Finite-rotation Shell Problems: Y. Başar and Y. Ding 165

A Universal Method for Including Shear Deformation in Thin Plate Elements: L. Yuqiu and X. Fei 171

A Simplified Analysis of Plate Structures Using Trefftz-functions: Ch. Hochard and L. Proslier 179

Improvement of Quadratic Finite Element for Mindlin Plate Bending: S.-H. Kim and C.-K. Choi 197

On a Highly Robust Spurious-mode Filtering Method for Uniformly Reduced-integrated Shell Elements: L. Vu-Quoc and C. Hoff 209

Indexed or abstracted by 'Abstract Jnl. in Earthquake Engineering', 'Applied Mechanics Review', 'Boundary Element Abstracts', 'Cambridge Scientific Abstracts', 'CITIS-Civil Engineering Abstracts', 'Compumath Citation Index', 'Current Contents', 'Engineering Index Inc', 'Eng. Societies Library', 'BHRA Fluid Engineering Centre', 'Geodex', 'Geotechnical Abstracts', 'Indian Society of Earthquake Technology', 'INSPEC', 'International Petroleum Abstracts', 'Mathematical Reviews', 'Mechanics', 'Newsletter of Engineering Analysis Software', 'Science Citation Index', 'SCISEARCH Database', 'Shock and Vibration Digest', 'Zentrablatt fur Mathematik'.

CONTACT, FRICTION AND LOCALIZATION

Signorini Problem with Coulomb's Law of Friction. Shape Optimization in Contact Problems: J. Haslinger 223

Unified Computational Model for Static and Dynamic Frictional Contact Analysis: A. Ibrahimbegovic and E. L. Wilson 233

Solution of Large Displacement Contact Problems with Friction Using Newton's Method for Generalized Equations: A. Klarbring and G. Björkman 249

Conjugate Projector Preconditioning for the Solution of Contact Problems: Z. Dostál 271

Stress Unilateral Analysis of Mooring Cables: J. E. Souza de Cursi 279

Non-linear Three-dimensional Finite Element Contact Analysis of Bolted Connections in Steel Frames: H. Rothert, N. Gebbeken and B. Binder 303

Effects of Softening in Elastic-plastic Structural Dynamics: G. Maier and U. Perego . . 319

Strain Localization in Multipotential Elastoplasticity: D. Aubry and A. Modaressi . . . 349

Analysis of Orthogonal Metal Cutting Processes: T. Tyan and W. H. Yang 365

Issue No. 2

Special Issue on the **World Congress of Computational Mechanics Part II**

PLENARY LECTURE

CFD State-of-the Art in the USSR: O. M. Belotserkovskii 395

COMPRESSIBLE FLUID DYNAMICS

A Non-linearly Stable Implicit Finite Element Algorithm for Hypersonic Aerodynamics: G. S. Iannelli and A. J. Baker 419

Generation, Optimization and Adaptation of Multiblock Grids Around Complex Configurations in Computational Fluid Dynamics: O.-P. Jacquotte 443

Time Marching Integral Equation Method for Unsteady Transonic Flows Around Airfoils: J. Su. 455

Numerical Simulation of the Separated Fluid Flows at Large Reynolds Numbers: V. A. Gushchin and V. N. Konshin. 469

Navier–Stokes Simulation of Flow Through a Highly Contoured Subsonic Diffuser: W. J. Chyu and D. P. Bencze. 473

Numerical Simulation of Three-dimensional Supersonic Flow Around Aerodynamic Configurations: P. I. Chushkin and G. P. Voskresensky 485

A Staggered Mesh Finite Difference Scheme for the Computation of Compressible Flows: R. Sanders. 507

A Preconditioning Mass Matrix to Accelerate the Convergence to the Steady Euler Solutions using Explicit Schemes: M. A. Storti, C. E. Baumann and S. R. Idelsohn . 519

Improving the Convergence Rate of the Petrov–Galerkin Techniques for the Solution of Transonic and Supersonic Flows: C. E. Baumann, M. A. Storti and S. R. Idelsohn . . 543

Simulation of Hypersonic Flows on Unstructured Grids: V. Selmin and L. Formaggia 569

Numerical Simulation of the Gas Flow in a Circuit-breaker: M. Reggio, J. Y. Trépanier, H. Zhang and R. Camarero 607

INCOMPRESSIBLE FLUID DYNAMICS

Transient Natural Convection from a Horizontal Cylinder Confined Between Vertical Walls—a Finite Element Solution: M. S. Sadeghipour and S. K. Hannani 621

Higher-order Solutions of Square Driven Cavity Flow using a Variable-order Multi-grid Method: H. Nishida and N. Satofuka 637

On Stable Equal-order Finite Element Formulations for Incompressible Flow Problems: J. K. Filho and A. F. D. Loula 655

Boundary Element Method of Multi-lobe Hydrodynamic Lubrication Bearing for Numerical Analysis in Lubrication Theory: Y. Dequan. 667

Semi-explicit and Explicit Finite Element Schemes for Coupled Fluid/Thermal Problems: B. Ramaswamy, T. C. Jue and J. E. Akin 675

CONFERENCE DIARY 697

Issue No. 3

Special Issue on the **World Congress of Computational Mechanics Part III**

PLENARY LECTURE

Grapplings with the Simulation of Non-Newtonian Flows in Polymer Processing: S.-F. Shen 701

FLUID MECHANICS GENERAL

Numerical Simulation of Unsteady Multiphase Pipeline Flow with Virtual Mass Effect: E. Bournaski 727

A Taylor–Galerkin Finite Element Method for Non-Newtonian Flows: H. R. Tamaddon-Jahromi, D. Ding, M. F. Webster and P. Townsend 741

Computation of MPD Flows and Comparison With Experimental Results: P. C. Sleziona, M. Auweter–Kurtz and H. O. Schrade. 759

Cellular Automata Simulation of Flow Around Chains of Cylinders: W. Eissler, P. Drtina and A. Frohn 773

Conservative Versions of the Locally Exact Consistent Upwind Scheme of Second Order (Lecusso-Scheme): C. L. Günther 793

A Logic for Simple Petrov–Galerkin Weighting Functions: J. Freund and E.-M. Salonen 805

Adaptive Finite Difference Methods for Liquid Membranes: J. I. Ramos 823

OPTIMIZATION

A Hybrid Optimal Synthesis Method for Truss Structures Considering Shape, Material and Sizing Variables: S. Ohkubo and K. Asai 839

Second Order Approximations in Structural Genesis and Shape Finding: H. P. Mlejnek, U. Jehle and R. Schirrmacher 853

Structural Analysis and Optimization Modelling Including Fracture Conditions: H. A. Eschenauer and V. V. Kobelev 873

Shape Optimization of Two Dimensional Bodies by Boundary Changing Method and Thickness Changing Method: A. Hasegawa. 889

Multicriteria Optimization of Pin-Jointed Structures with Overall Stability Constraints: R. Kacianauskas, R. Kutas and D. Maciulevicius 893

Sensitivity Analysis—The Basis for Optimization: S. Kibsgaard 901

Fracture Mechanics and Optimal Design: A. V. Pitukhin 933

Supporting Design Decisions by Prolog Database: A. Borkowski, S. Jóźwiak and M. Danicka. 941

Design Sensitivity Coefficients for Elasto-viscoplastic Problems by Boundary Element Methods: Q. Zhang, S. Mukherjee and A. Chandra 947

ADAPTIVITY

Numerical Investigation of Element-Wise *a posteriori* Error Estimation in Two and Three Dimensional Elastic Problems: H. Ohtsubo and M. Kitamura 969

A posteriori Error Estimation for Triangular and Tetrahedral Quadratic Elements using Interior Residuals: P. L. Baehmann, M. S. Shephard and J. E. Flaherty 979

An Adaptive Finite Element Procedure for 2D Dynamic Transient Analysis using Direct Integration: L. F. Zeng, N.-E. Wiberg and L. Bernspång. 997

Automated Adaptive Analysis of the Biphasic Equations for Soft Tissue Mechanics using *a posteriori* Error Indicators: P. S. Donzelli, R. L. Spilker, P. L. Baehmann, Q. Niu and M. S. Shephard 1015

An Integrated Approach for Automated Generation of Two/Three Dimensional Finite Element Grids using Spatial Occupancy Enumeration and Delaunay Triangulation: C. V. Ramakrishnan, S. Ramakrishnan, A. Kumar and M. Bhattacharya 1035

Characteristic, Local Grid Refinement Techniques for Resevoir Flow Problems: H. K. Dahle, M. S. Espedal and O. Sævareid 1051

CONFERENCE DIARY 1071

AUTHOR INDEX 1075